

Application Serial No.: 10/521,335
Amendment and Response to February 22, 2006 Non-Final Office Action

REMARKS

Claims 1 through 20 were in the application. Those claims have been cancelled by this amendment, and claims 23- 33 are newly presented. No new matter is believed to have been added. Support for the new claims is found in the specification as originally filed. Reconsideration and further examination are respectfully requested.

The Examiner has apparently objected to the specification as improperly incorporating material by reference. Applicants have reviewed the specification and have been unable to identify any such incorporation by reference. If the objection is maintained, Applicants respectfully request that a specific line and page be pointed out so that appropriate correction can be made. Further, Applicants have reviewed the Abstract and respectfully assert that it is believed in compliance with US PTO rules. Again, if the objection is maintained, a specific objection would help Applicants correct the matter.

The Examiner has rejected claims 1-20 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. Applicants have canceled claims 1-20 and have presented new claims 23-33 which are believed to be in compliance with §112. For example, independent claim 23 recites "each optical waveguide grating curvature sensing device comprising at least one long period grating". Furthermore, the "optical interrogation means" is defined more explicitly to comprise an "optical source" and "optical detection means". In addition, other specific phrases, such as "may be" and "preferably", which the examiner objected to have been deleted from the newly presented claims. The claims are believed in compliance with all requirements of 35 U.S.C. §112 and withdrawal of this ground of rejection is respectfully requested.

The Examiner has rejected claims 1-2 and 12 as being anticipated by Kersey et al., U.S. Patent No. 5,748,312 ("Kersey") in view of Chen et al., U.S. Patent No. 6,256,090 ("Chen") and further in view of Glenn et al., U.S. Patent No. 4,808,950 ("Glenn"). Further, claims 3-11 and

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13-20 are rejected as being unpatentable over Chen et al. or Glenn et al. in view of Kaylor et al., U.S. Publication No. 2004/0078219 ("Kaylor"). As claims 1-20 have been cancelled, the patentability of new claims 23-33 will be discussed herein.

New independent claim 23 now recites that the optical waveguide grating curvature sensing device comprises at least one long period grating, and further recites additional features of the optical interrogation means. A long period grating is a region of the refracted index variation which preferentially couples particular wavelengths of light from the fibre core into the fibre padding, thereby producing attenuation bands (resonances) within the transmission spectrum of the optical fibre (see lines 14-22 of page 11 of the published PCT application). These resonances are affected in various ways by bending the fibre (see lines 23-29 of page 11 of the published PCT application).

None of the references cited by the Examiner teach or suggest these features of claim 23. In particular, each of the references cited and relied upon by the Examiner relate to Bragg grating sensor technology as opposed to the long period gratings recited in claim 23. Bragg gratings sense strain but do not sense curvature directly, so such gratings need to be mounted in a structure that relates strain and curvature. In contrast, long period gratings are directly sensitive to curvature. Furthermore, the references cited and relied upon by the Examiner certainly do not describe the mechanism used in claim 23 to determine the bending of the fibre from the attenuated transmission spectrum. In particular, as recited in claim 23, a wavelength modulated narrow spectral bandwidth optical signal interrogates one or more of the optical waveguide grating curvature sensing devices and, at the output end of the optical fibre, the amplitude of detected optical signal is measured at a harmonic of the modulation frequency. Such an apparatus is able to provide accurate measurements of the curvature compared to the systems described in the prior art. Moreover, the cited and relied upon art provide no motivation for a person of ordinary skill in the art to make the necessary modifications to arrive at the claimed invention. At least for these reasons, Applicants respectfully submit that claim 23 is not anticipated or rendered obvious by the art cited and relied upon by the Examiner.

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Claims 24-33 are believed patentable at least as depending from a patentable base claim.

CONCLUSION

Accordingly, Applicants respectfully request allowance of the pending claims. If any issues remain, or if the Examiner has any further suggestions for expediting allowance of the present application, the Examiner is kindly invited to contact the undersigned via telephone at (203) 972-0081.

Respectfully submitted,



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Date

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